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Quantitative Historical Social Research: The German Experience *)

Heinrich Best and Wilhelm Heinz Schröder

Quantitative Methods in History: Between Methodological Rigorism and Pragmatism

At the German Historians' Congress in Mannheim in 1976, Jürgen Kocka warned: "In this country .. we tend to criticize a thing before it really exists¹⁾." This statement anticipated the controversy, the spread of quantification was expected to raise in the Federal Republic of Germany. Two issues were at stake: what is history, and what criteria are there for truth in history? Jürgen Kocka's prognosis, shared by many, seemed to be well-founded. In the United States ten years earlier, quantification had arisen in explicit and definite opposition to "traditional" historiography and its proponents had claimed that history could only be considered scientific when based on numerical evidence and formalized methods. At about the same time, Arthur Schlesinger, the most prominent representative of the "traditionalists" formulated his famous verdict on quantification: All significant questions were significant precisely because they defied quantitative answers²⁾. When quantitative methods became an issue in the Federal Republic of Germany, the debate in the United States had already become heated³⁾. It only seemed natural that the controversy on quantification would be imported into the Federal Republic along with the method itself. The spread of quantitative methods was nevertheless inconspicuous and uncontroversial. The reasons for this "German *Sonderweg* to quantification" can only briefly outlined in this essay. It was specially important that just at this time the sociological debate on methodology which had examined the concept of experience maintained by the social sciences had died down.

Since this discussion also dealt with the value of analytical and hermeneutic methods for epistemology, the American quantification controversy seemed to offer nothing new to a German public concerned with methodological pro-

*) Translated by Ray Rosdale (Berlin).

1) Jürgen Kocka, "Quantifizierung in der Geschichtswissenschaft," in: Heinrich Best and Reinhard Mann, eds., *Quantitative Methoden in der historisch-sozialwissenschaftlichen Forschung* (Stuttgart, 1977), p. 4.

2) A good survey of the American debate is Allan G. Bogue, *Clio and the Bitch Goddess. Quantification in American Political History* (Beverly Hills et al 1983); cf. also Robert W. Fogel, "Scientific and Traditional History" in: L. J. Cohen et al., eds., *Logic, Methodology and Philosophy of Science* (Amsterdam, 1982); J. Morgan Kousser, "Quantitative Social Scientific History," in: H. Kammen, ed., *The Past Before Us: Contemporary Historical Writing in the United States* (Ithaca, 1980), pp. 433-456. Arthur Schlesinger's statement is quoted in C. V. Woodward, "History and the Third Culture," in: *Journal of Contemporary History* 3 (1968), p. 29.

blems, except possibly for a blatant scientism seldom seen here.

Another explanation for this *Sonderweg* is that the discussion in German historiography in the 1960s and early 1970s showed little interest in the methodological foundations of history, but rather centered on the selection and interpretation of concrete historical topics. An example of this orientation is the controversy on the German power-elite's responsibility for the outbreak of World War I. When set against this passionate debate on the reinterpretation of German history, quantification seemed an esoteric methodological innovation that could not readily be associated with any particular political camp or historiographical school. Quantification was put to very disparate use: as a means to help perfect positivist fact-collecting and fact-processing⁴); as a method of letting the "silent masses" speak⁵); or even as part of the methodological canon of Marxist historiography⁶). Out of fear that they might be banished into the esoteric realm of "pure" specialization, the early protagonists of quantification consciously avoided methodological rigorism. The composition of the membership of the advisory council for the "Association for Quantification and Methods in Historical and Social Research" (QUANTUM), founded in 1975, demonstrates that a pluralism in political and scientific orientation stood at the cradle of German quantitative historical research⁷).

This pluralism did not mean there were no differences of opinion or programmatic controversies. But the use of quantitative methods must really be seen in the context of a more general historiographical development: The field of research which viewed itself as a "history of society" (in the broadest sense of term) was moving towards the research logic and methodological standards of the systematic social sciences⁸). The keyterms structuring the different stages of this development are --in order of their introduction-- *social history*, *structural history*, *historical social science*, and *historical social research*. In this context, historical social research represents a methodological paradigm, meaning more than quantification in the sense of an auxiliary science.

3) Some of the most important contributions are to be found in an anthology, published repeatedly since the middle of the 1960's: Ernst T o p i t s c h, ed., *Logik der Sozialwissenschaften* (Königstein/Ts., 1984).

4) Cf. for instance, Carl August L ü c k e r a t h, "Prolegomena zur elektronischen Datenverarbeitung im Bereich der Geschichtswissenschaft," in: *Historische Zeitschrift* 207 (1968), pp. 265 - 296.

5) Cf. Richard T i l l y, "Sozialer Protest als Gegenstand historischer Forschung," in: H. R. Tilly, *Kapital, Staat und Protest in der deutschen Industrialisierung* (Göttingen, 1980), p. 175.

6) For a comprehensive treatment see Don Karl R o w n e y, ed., *Soviet Quantitative History* (Beverly Hills, 1984).

7) Cf. *Historical Social Research/Historische Sozialforschung* 17 (1981), p. 96 f.

8) Cf. Heinrich B e s t, "Histoire sociale et méthodes quantitatives en Allemagne Fédérale," in: *Histoire moderne et contemporaine informatique* 7 (1985), pp. 3 - 28.

At the beginning of this development, stood social history defined by Werner Conze as "history of society, more explicitly, of social structures, sequences of events, movements 9)." However, this global definition does not make clear the distinction between social history and the other approaches which we will be discussing. One distinguishing feature of social history is the subject tackled: traditionally, the field of social history is society without politics or, as George M. Trevelyan put it, "the history of a people with the politics left out 10)." The second differentiating feature lies in the method and the criteria of truth applied. Near the end of the 1960's Werner Conze could still claim: "The methods of social history are characterized by the methods—generally valid in history—of historical source criticism and that of 'understanding' history 11)." But in fact, both aspects were at this time in the process of further development. This made itself most strongly felt in the broadening of the topics deemed valid for social history. Werner Conze emphasized that social history was as much "political history" as the history of events and decisions 12). With reference to Otto Brunner, Hans Mommsen similarly characterized social history as a "general view" intent on the "inner construction, the structure of human organizations 13)."

"Structure" became the key term in the next discussion. The concept of "*histoire des structures*" (i. e. history of structure, structuralist history) proposed by Fernand Braudel and elaborated in many articles published by the French journal, *Annales*, was an attempt to reconstruct the historical "relationships" and "conditions" of supra-individual developments and processes without explicitly concentrating on certain areas of historical reality. Nonetheless, the political system was generally excluded *de facto* 14). Often associated with this approach, was the demand for an understanding of the total historical process in its synchronic and diachronic context. But in the attempts at a "*histoire totale*", a comprehensive history of economics, society, politics and culture (large-scale in space and time), the specific weaknesses of "structuralist history" became apparent. Upholding a "sharp demarcation between structures and non-structures (events, decisions and actions) in history is theoretically and practi-

9) Werner Conze, "Sozialgeschichte," in: Hans-Ulrich Wehler, ed., *Moderne deutsche Sozialgeschichte*, 3rd ed. (Köln/Berlin, 1979), p. 19.

10) George M. Trevelyan, *Illustrated English Social History* (New York, 1962) (first publ. 1944), p. XI.

11) Conze, *Sozialgeschichte*, p. 25.

12) *Ibid.*, p. 24.

13) Hans Mommsen, "Sozialgeschichte," in: *Moderne deutsche Sozialgeschichte*, p. 34.

14) Jürgen Kocka, *Sozialgeschichte. Begriff-Entwicklung-Probleme* (Göttingen, 1977), p. 70 f.; Michael Erbe, *Zur neueren französischen Sozialgeschichtsforschung. Die Gruppe um die "Annales"* (Darmstadt, 1979). For the German reception see especially the introduction, p. 27 ff.

cally very difficult and problematical 15).” Another weakness of the structuralist approach was the arbitrary way the facts were “assembled” into integral large-scale histories. Indeed, structural history had no substantial theory that would facilitate the selection of relevant facts, no hypotheses at its disposal on the interdependence between economics, politics and other areas of reality, nor was it able to formulate provable hypotheses that would identify the causal and functional relationships between the individual aspects of the historical reality studied and the important factors of changes 16). Polemical criticisms sometimes termed this approach, the “sandwich-method” or “desk-drawer history.” Brilliant descriptions of great literary quality were occasionally the result, but consistent and far-reaching explanations remained rare.

In this point the programm of historical social science went further than structuralist history: “The growing insight into the often cited ‘theoretical poverty’ of history played a major role in the development of historical social science 17).” Referring almost exclusively to the theoretical advances of the systematic social sciences, this claim usually means that sociological terms, categories and models are fitted into historical argumentation. But less stringent demands are placed on the scope and explanatory force of theoretical statements: historical social science is concerned with “changes in a historical period under the specific conditions of that period 18)” and not with supra-historical theoretical laws. The theoretical statements of historical social science are primarily “ad-hoc theories”, i. e. “hypotheses, used exclusively to transform present (restricted) regularities into a complex of theoretical statements neither integrated into a broader context, nor applied in their valid range to other areas or periods 19).” Though some representatives of historical social science claim to formulate “mid-range theories”, this practice actually violates the given range of such propositional systems. “In order to broaden an ad-hoc theory into a mid-range theory, the series of invariables and regularities covered must be confronted with similar invariables differing in space and time. This will either lead to a unified mid-range theory or to a typological differentiation..., in which case the development of a theory on a higher level of abstraction will become necessary to cover and explain the different types equally well 20).” The proponents

15) K o c k a, Sozialgeschichte, p. 73.

16) Ibid., p. 79.

17) Reinhard R ü r u p, “Zur Einführung,” in: Rürup, ed., Historische Sozialwissenschaft (Göttingen, 1977), p. 8.

18) Ibid.; cf. also Winfried S c h u l z e, Soziologie und Geschichtswissenschaft. Einführung in die Probleme der Kooperation beider Wissenschaften (München, 1974), p. 188.

19) Rene K ö n i g, “Grundlagenprobleme der modernen soziologischen Forschungsmethoden (Modelle, Theorien, Kategorien),” in: Sozialwissenschaft und Gesellschaftsgestaltung-Festschrift für Gerhard Weisser (Berlin, 1963), p. 26.

20) Ibid., p. 30.

of historical social science, however, would reject this procedure as "unhistorical." Even though it would be desirable for historical social science to define its demands on theory more clearly, the use of ad-hoc theories is legitimate and fruitful. Empirical social research also makes use of such propositions whose range is limited to the particular problem discussed. A more problematic aspect of historical social science research is the use of individual sociological terms and categories out of their theoretical context; another difficulty is the use of theory in which "explanations" are later "transposed" onto the evidence. This inductive procedure leads to arbitrariness. The "results" observed can be "explained" by a theoretically infinite number of "causes". It is impossible to form a logical chain from observation to theoretical propositions ²¹).

The methodological practice of historical social science is subject to severe criticism too. Though the representatives of historical social science demand a fusion of "historical-hermeneutic" and "analytical-social scientific" methods, historical social science, in practice, rarely goes beyond hermeneutics, rarely resorting to quantitative methods even for illustrative purposes. However, descriptive casuistry does not suffice for testing theories, since it leads to discrepancies between the proposed range and empirical proof of theoretical propositions on past society.

In this regard historical social research is a further development of historical social science. Generally speaking, historical social research can be defined as "theoretically motivated research into societies, past and present, with valid methods—valid, in the sense that the scope of the research operations fit the scope of the theoretical propositions ²²)." In our case, it may be defined as "empirical, especially quantitative, research on social structure and processes in history, considered theoretically and methodically ²³)." This approach is neither "neo-positivist", since it is theoretically based, nor can it be simply viewed as a historical application of empirical social research, since the particulars of historical data and the demands placed on theories able to deal with historical facts differ in many respects from a contemporary sociology. The relationship between empirical and historical social research may be characterized by saying that the methodological standards of empirical social research (though not necessarily the methods themselves) have gained acceptance in historical social research. Since historical social research deals with collective phenomena, the acceptance of these standards implies the use of quantitative methods. In

21) Heine von Almann, *Der Forschungsprozeß. Eine Einführung in die Praxis der empirischen Sozialforschung* (Stuttgart, 1977), p. 25.

22) Heinrich Best, "Quantifizierende Historische Sozialforschung in der Bundesrepublik Deutschland. Ein Überblick," in: *Geschichte in Köln* 9 (1981), p. 147.

23) Wilhelm H. Schröder, "Kollektive Biographien in der historischen Sozialforschung," in: Schröder, ed., *Lebenslauf und Gesellschaft* (Stuttgart, 1985), p. 8.

contrast to the traditional use of statistics in social history, historical social research transforms qualitative information into numerical data which is then turned over to mathematical calculation, quantitative evidence is not used just as an illustrative, but to test hypotheses.

Theory - - Research Tool and Epistemological Goal in Quantitative Historical Social Research

The theoretical component in the definition of historical social research is based on two presuppositions that need further clarification. Historical social research is guided by a research strategy led by theoretical suppositions and aims at confirmation of the most general hypotheses possible. A brief look at the practice of quantitative historical research demonstrates that the first presupposition mentioned above is in no way self-evident. Quantification is not necessarily associated with conceptualization and theoretical orientation. Many users see quantification and data-processing as further developments of the fundamental procedures used in traditional historical research, with the old historiographical aim of putting all available sources and interpretative methods to use in order to win the most detailed, complete and objective knowledge of the past possible. In this respect, the computer is a tool for reconstructing past reality "like it really was". Behind this view, there is a methodological supposition rarely made explicit: historical events, processes, and persons may best be understood by considering all the sources deemed relevant. A characteristic expression of this view can be found in the early discussion on data-processing in German publications. Data-processing was viewed as an auxiliary tool necessary only for expanding history's capacity for mass sources ²⁴).

It soon became apparent, however, that the great capacities and flexibility of electronic data-processing were changing the direction of research in a way many neither desired nor expected: the choice of a data base with adequate indicator qualities, the necessity of sometimes rigid classification of material before data-processing, and, finally, the selection of appropriate methods of statistical analysis made it necessary to begin research with an adequate conceptualization of the historical processes and phenomena observed. Relinquishing theory would immediately reduce the quality of the research undertaken: the facts collected cannot—in and of themselves—reveal the criteria that would make possible the appropriate selection, classification and combination of those same facts. The postulate of a theory-free fact base contradicts important pre-suppositions of quantification; or put in other terms, "there can be no measurement without theory" ²⁵).

24) cf. et al. Rolf Gundlach and Carl August Lückerrath, *Historische Wissenschaften und elektronische Datenverarbeitung* (Frankfurt on the Main, 1976); cf. also Lückerrath, *Prolegomena*.

Quantitative research therefore must begin with theoretical reflection. Not only does this requirement apply to the high-level testing of hypotheses, but also to the "simple" descriptive presentation of empirical data. Since no description is able to reflect reality in all its complexity, it must confine itself to a particular segment. The decision as to which part of reality should be examined or which characteristics are relevant for analysis and should therefore be surveyed, can only be made on the basis of theoretical criteria; which only then dictate further steps, such as the type and manner of source selection, collection of data, etc. This fundamental and logical priority of explicit theoretical consideration does not mean, as far as everyday research work is concerned, that the researcher – completely independent of the concrete context of his research – is chiefly concerned with some "pure" development of theory; but, rather, that he will naturally consider the conditions for research (availability of primary and secondary sources, methods, techniques, etc.) in the process of developing theory, in order to guarantee the success of his research.

In this respect, the traditional process of historical research is reversed. Instead of being the hesitantly pursued and rarely attained culmination of positivist fact-gathering, theory becomes the starting point for the epistemological process. Instead of making hypotheses and normative propositions on the basis of observation, theoretical propositions are confronted with reality. Put in ideal-typical terms, the meta-theoretical model of induction is replaced by a deductive one—an unexpected dynamic of a technology often indiscriminately applied. This has put some users in the thankless position of the "sorcerer's apprentice", unable to contain the magical forces he had brought to life.

Another underlying meta-theoretical presupposition is a consequence of the maxim that the goal of the epistemological process in historical social research is to formulate the most general theoretical propositions possible. But even this assumption is neither obvious nor undisputed. Many historians still uphold the view that it is not possible to speak of laws in the same sense that one can in the natural sciences. This stance is based on the proposition that human activity and, in this sense, all historical phenomena, are symbolic in character and are the result of human intention (26).

At the beginning of the 19th century, the German philosopher Windelband distinguished between the two opposing metatheoretical positions considered here. His definition of nomothetic and ideographic scientific thinking is still

25) Michael Drake and Peter Hammetton, *Exercises in Historical Sociology* (Walton Hall, 1974), p. 12.

26) Peter Christian Ludz and Hans-Dieter Rönisch, "Theoretische Probleme empirischer Geschichtsforschung," in: Theodor Schieder and Kurt Gräubig, ed., *Theorieprobleme der Geschichtswissenschaft* (Darmstadt, 1977), p. 63; exemplary for the state of the general discussion on theory in German historiography are the earlier four volumes in the series, *Theorie der Geschichte*.

significant for the contemporary discussion on the philosophy of science 27). Windelband saw the natural sciences as being characterized by nomotheticism and the cultural sciences (*Geisteswissenschaften*)--or more generally, "human sciences"--by ideographism; but the social sciences were increasingly guided by natural science's concept of experience. Today, laws of the type represented by "Newton's Law" are the epistemological goal of a portion of sociology. This development was the maxim of the "unity of the empirical sciences", most prominently represented by Hempel and Popper. If science aims at the truth, and truth is undivided, then there must be a unified approach capable of perceiving this truth. The goal of the epistemological process cannot, therefore, be reduced to the development and application of theoretical concepts and structure types (to which many traditional historians would consent); the epistemological process must aim at the formulation and investigation of covering laws, understood here as "strictly universal, physically necessary (i. e. nomological) assertion on stable relationships of at least two classes of events 28)."

Does that historical research which claims to be non-theoretical, actually lack theory? The argument is certainly justified that even a narrative and associative history is implicitly or latently theoretical. This is true in, at least, two respects: 1) It is assumed that the facts considered are relevant (principle of relevancy); 2) upon closer inspection the narrative itself reveals itself to be a chain of assumed causalities, a web of relationships. This fact is occasionally characterized in the discussion as the "paradigm of historical sequence." Theoretical assumptions, in the broadest sense, lay the foundations for this paradigm. In the most general sense, these may be on the categorial level: e. g. "determinism", "causality", "accident", and "freedom"; they may involve descriptions of the motor force attributed to particular agents and agencies in history, e.g. ideas, great men, divine guidance, moral forces, climate, geography, social and economic conditions; and theoretical assumptions may also be seen in the categories dealing with the course of historical processes: e. g., "irreversibility of development", "repetition", "progress", and those inherent in historical stages theories. Usually, these paradigms are not made explicit in the formulation of historical relationships; nonetheless, they are present and play a structuring role in the historian's portrayal of events and his presentation of the evidence for relationships 29). The distinction between theoretically oriented historical research and narrative historiography lies, therefore, in the different degree of explicitness of the hypotheses and normative propositions utilized. If

27) W. Windelband, *Präludien, Aufsätze und Reden zur Einführung in die Philosophie*, 4th rev., vol. 2 (Tübingen, 1911), p. 145.

28) Bernhard Giesen and Michael Schmid, "Erklärungsprobleme in den Sozialwissenschaften," in: Giesen/Schmid, ed., *Theorie, Handeln und Geschichte* (Hamburg, 1975), p. 14.

29) *Ibid.*, p. 11.

we assume (as most do) that every type of research should attempt to reconstruct the epistemological process as far as possible and, thus, be open for criticism (intersubjectivity), then explicitly theoretical historical research must be preferred.

Further criticism of the theoretization of historical research is based on a different view of the epistemological goal of history. It is argued that the historian's task is to understand historical facts, but not to give causal explanations. The hermeneutic modus of experience is made obligatory for history³⁰). History should, therefore, describe various aspects of culture, but not formulate covering laws. Though seen from a different angle this view returns to the contrast between ideographic and nomological method as defined by Windelband. One might object that this distinction was not, as many philosophers of science seemed to suppose, that important for theoretically oriented social research. One example is Max Weber's classical definition of sociology as a science "which understands and interprets social action, and in so doing attempts to explain its course and effects³¹)." Even in a sociology which views itself as a rule-bound science, the researcher is only capable of comprehending the information inherent in his material when he knows the system of linguistic signs, the symbolic language in which his material has been written. "It, therefore, plays no great role—as far as epistemological theory is concerned—whether this information is directly perceived through immediate social contact (as in interviews), or indirectly, through historical documents³²)." The fact that both sociology and history are tied to the hermeneutic modus of experience must not necessarily contradict their theoretical orientation. To put it differently: the question, "what happened in the past?" is intrinsically bound to the question, "why did it happen?"

Theoretically oriented quantitative history is often also criticised because of the defects and difficulties in the transmission of historical data. Historical data are "inadvertent" data, i. e. they are usually neither gathered nor transmitted under scholarly auspices, and even if scientists were involved in the production of contemporary data, they were interested in particular aspects not necessarily of interest to future researchers. Historical data are, in this sense, the by-products of economic, social and cultural processes. Neither their production nor their transmission are usually scientifically controlled. At best, retrospective interviews are an exception to this, although they do suffer from other flaws.

30) Peter Christian L u d z, "Soziologie und Sozialgeschichte: Aspekte und Probleme," in: Ludz, ed. "Soziologie und Sozialgeschichte," in: Kölner Zeitschrift für Soziologie und Sozialpsychologie, special issue 16 (Opladen, 1972), p. 16.

31) Max W e b e r, *Wirtschaft und Gesellschaft*, (Studienausgabe) (Tübingen, 1972), p. 1.

32) P. Ch. L u d z, "Aspekte", p. 16.

Seen in this light, some observers have asked whether historical social research could ever be anything more than a "tincture of empirical evidence combined with bits of useful theory and mixed with large elements of impression, surmise and empathetic understanding 33)." One may object to this verdict, however, on the grounds that contemporary sociology is making increasing use of data, whose production is hardly scientifically controlled either. An example of this are the so called process-produced data, i. e. the internal records of public and private organizations not gathered for scientific use 34). The same is true of documents and texts that are the database for computer-supported content analysis 35). For this material, empirical social research developed and is still developing systematic theories of biased recording which allow for a better evaluation of the data's reliability, validity, and range. One can expect that this knowledge may compensate for insufficient research control over the process of data-collecting and transmittance. On the other hand, empirical social research regards its own data, especially when attained through questionnaires, with growing scepticism. As a result, contemporary empirical social research is relying increasingly on "unobtrusive measure" without, however, surrendering its theoretical orientation. Many of today's social scientists are becoming more aware that their data on society can only approximate social reality. In this sense, sociology has, at best, a quantitative, but not a qualitative advantage over history, which has always viewed its sources as incomplete and faulty. One may go further: even in the natural sciences it is well known that measurement procedures may affect the phenomena under investigation. This "uncertainty principle" resembles the concept of "validity" in the social sciences.

The Research Process in Quantitative Historical Social Research

It should not be surprising that the course of quantitative historical social research generally parallels empirical social research 36). Differences may be

33) Jerome M. Clubb, "The 'New' Quantitative History: Social Science or Old Wine in New Bottles?" in: Clubb / Erwin K. Scheuch, eds., *Historical Social Research. The Use of Historical and Process-Produced Data* (Stuttgart, 1980), p. 370 f.

34) Wolfgang Bick / Paul J. Müller, "The Nature of Process-Produced Data--Towards a Social Scientific Source Criticism," in: Clubb / Scheuch, op. cit., p. 370 ff.; for a comprehensive treatment: Wolfgang Bick et al., ed., *Sozialforschung und Verwaltungsdaten* (Stuttgart, 1984).

35) Heinrich Best, "Analysis of Content and Context of Historical Documents--The Case of Petitions to the Frankfurt National Assembly 1848/49," in: Clubb/Scheuch, op. cit., p. 244.

36) In the meantime, an imposing number of such introductions has been published which, depending on their different intentions, give special emphasis to the areas of theory, general methodology, specific research methods and application practice in research and education, cf. et al.: Jürgen Friedrichs, *Methoden empirischer Sozialforschung*, 12th ed. (Stuttgart, 1984); Peter A. Tetsander, *Methoden der empirischen Sozialfor-*

observed, however, due to the special nature of the historical social researcher's primary-source material, and his relationship to the period on which he is working. For historians, inquiry into the significance and condition of the source material is of greater importance than for empirical social researchers who have standardized – though imperfect – fact-collecting instruments at their disposal. Whereas the latter draws on his personal experience for inspiration in the development of theories and criteria for the evaluation of evidence, the former must first attain comprehensive knowledge of previous societies through intense effort. Technology is no substitute for this work – even our electronic age has not yet developed a machine capable of generating theory or interpretations.

The main steps in a research strategy resulting from a deductive research logic that are briefly outlined below should be seen as a model description of the procedure predominant in quantitative research 37). Inductive “feed-back” is common and can be combined with hermeneutic methods.

The aim of formulating an “empirical theory” is the starting point of the historical social research strategy. This simply means that the researcher collects his hypotheses (questions) and assembles them in the most systematic, logical and uncontradictory manner possible. Theories/hypotheses must refer to reality, so that they may be proved faulty when confronted with empirical observation. It is necessary to form theories/hypotheses at the beginning of research, since only then can decisions be made pertaining to the methods and instruments of research needed.

In a second step, important prerequisites for the intersubjective examination and control of statements on reality (i. e. on the area to be studied) must be developed by formulating precise terms, and operationalizing them appropriately. The terms used in theoretical statements must be clearly defined before beginning the empirical investigation. Each term is accorded a series of characteristics with the help of semantic rules; characteristics are, in this sense, observable events and/or words, whose meaning is known. In order to define a term it is often necessary to analyse its meaning systematically or empirically. In empirical research, nominal definitions are usually preferred as they are especially

schung, 5th ed. (Berlin, 1985); Rolf Prim /Heribert Tilmann, Grundlagen einer kritisch-rationalen Sozialwissenschaft, 5th ed. (Stuttgart/Heidelberg, 1983); Erwin Roth, ed., Sozialwissenschaftliche Methoden (Munich, 1984); Franz Krompka, Sozialwissenschaftliche Methodologie (Paderborn, 1984); Horst Kern, Empirische Sozialforschung (Opladen, 1980). Insofar as statements referring to the methods of empirical social research are made below, see the sources already mentioned above.

37) The elements mentioned in our survey are in general accordance with the study units of our basic curriculum: Heinrich Best/ Wilhelm H. Schröder, “Basis-curriculum für eine quantitative historische Sozialforschung,” in: Historical Social Research/ Historische Sozialforschung 17 (1981), pp. 3 - 50.

suiting for subject-structuring; in nominal definitions a term already known (definiens) is substituted for the term to be defined (definiendum).

Operationalization is the most important step in historical social research when the theoretical and empirical level are brought together. The validity and reliability of operationalization are decisive for the quality of scientific argumentation. Operationalization aims at linking previously defined terms needed for empirical investigation of quantifiable data. Operational definitions determine the research operations which enable the researcher to decide whether or not the case investigated corresponds to the term defined. The concrete procedure is dependent on the relation between the empirical sphere and the term to be operationalized. In a direct relation, the situation described by the term can be directly observed or perceived. In this case, the operations of research can be immediately undertaken (information on what, where, when, and how the counting should be done). For terms with an indirect empirical relation, indicators must first be developed. Indicators, aided by the empirically observable, should allow those phenomena to be inferred which are not directly observable but are, nonetheless, described by the term. These indicators are then also operationalized through information on the research operations necessary. The validity of indicator development is highly dependent on the precision with which those phenomena made observable by the indicator, reflect the situation described by the term. Indicator development must, therefore, be substantiated by careful indicator analysis.

In a third step the selection procedures and techniques for historical data must be determined. At this stage of research, genuinely historical methods (especially source criticism), as well as those of empirical social research (sampling procedures) may be put to work with complementary benefit³⁸). The historian's usual procedure may be so summarized: he determines the historical problem area to be examined, decides on the appropriate source material, considers the availability of sources and then works through all the sources available (i. e. in an ideal case) while applying the method of historical source criticism. The assumption usually implicit in this procedure is well known: "somehow" the sources and historical reality will correspond; the problem of representativeness and selectivity of sources is usually only superficially handled and then in a casuistic-descriptive and not in a statistical manner. But even brilliant source criticism may lead to an insufficient treatment of sources in historical social research, characterized by a double problem: On the one hand, historical sources are

38) Cf. Harald Rohlinger, "Quellen als Auswahl--Auswahl aus Quellen," in: *Historical Social Research/Historische Sozialforschung* 24 (1982), pp. 34 - 62; Paul J. Müller, "Improving Source Criticism to Cope with New Types of Sources and Old Ones Better," in: *ibid.*, pp. 25 - 33; for practical application see Erdmann Weyrauch, "Datenverarbeitung als Quellenkritik?" in: Paul J. Müller, ed., *Die Analyse prozeßproduzierter Daten* (Stuttgart, 1977), pp. 141 - 198.

often incomplete, i. e. only a segment is available; on the other hand, the historical social researcher might take a technically poor sample from those sources that are available.

When historical sources pertaining to the question studied are incomplete or only a sample is available, the validity of further research depends on the researcher's capacity to determine what type of "selection", in relation to the "complete" body of non-accessible sources, the available sources represent. The question may also be put this way: which subset of objects from what total population do the sources constitute? Since there is often no adequate and certainly no quantifiable information on the population, the historian must ascertain, how representative the sub-set of historical sources at his disposal actually is by considering the data available on the total population and by using the criteria of empirical theory already formulated. The further systematization and increasing precision (also statistical) of such decisions still remains a major methodological concern of historical social research. In the application of sampling procedures to historical sources one can again draw upon the methods of empirical social research (although not to the historical social researcher's complete satisfaction) ³⁹). Sampling is appropriate and, in the case of an abundance of sources, usually necessary when the total population may be precisely assessed. The degree of selection in the treatment of sources depends primarily on the necessity of economizing labor and resources, or on the subject studied. Despite some historians hankering for totality, it is often unnecessary and sometimes even damaging for the validity of empirical research to work through all accessible sources.

In the next step, the characteristics of the object to be investigated (units of analysis) are transformed into measurable variables. The construction of variables is a result of the operationalization of the terms already precisely defined. In this context, "variables" are terminologically defined characteristics of objects having several levels. Measurement is understood as the assignment of a set of numbers or symbols to the levels of a variable. This assignment must be systematic, i. e. all objects must be treated the same way and in accordance with the rules of assignment. This procedure is ordered according to the criteria of uniqueness (it is termed unique when every object can be ascribed to one level),

39) Cf. et al., Ferdinand Böltken, *Auswahlverfahren* (Stuttgart, 1976); Gabriele K a p l i t z a, "Die Stichprobe," in: Kurt H o l m, ed., *Die Befragung*, Vol. 1 (Munich, 1975), pp. 136 - 186; Erwin K. S c h e u c h, "Auswahlverfahren in der Sozialforschung," in: René K ö n i g, ed., *Handbuch der empirischen Sozialforschung*, vol. 3a (Stuttgart, 1974), pp. 1 - 96; Manfred S t u r m / Th. V a n j a, "Planung und Durchführung von Zufallstichproben," in: Jan v a n K o o l w i j k / Maria W i e k e n - M a y s e r, eds., *Techniken der empirischen Sozialforschung*, Vol. 6 (Munich, 1974), pp. 40 - 80; Jan v a n K o o l w i j k, "Das Quotenverfahren: Paradigma sozialwissenschaftlicher Auswahlpraxis," in: *ibid.*, pp. 81 - 99; Roger S. S c h o f i e l d, "Sampling in Historical Research," in: E. A. W r i g l e y, ed., *Nineteenth-Century Society* (Cambridge, 1972).

exclusiveness (it is exclusive when only one and not more than one level of a characteristic is appropriate) and completeness (it is complete when both criteria listed above are fulfilled for all objects). When these requirements are completely met, one speaks of a "classification." When these requirements are incompletely fulfilled, one speaks of a "typology." In this sense, a variable may also be defined as a set of values (levels) forming a classification (or typology).

In historical social research, measurement is often done according to nominal scale characteristics, i. e. the levels of a given variable have no substantially interpretable order or other metric properties. For a long time, this meant that the statistical processing of such data was restricted to simple descriptive procedures such as marginal distribution and cross-tabulation. The last few years, however, have seen the development of more sophisticated statistical procedures for the analysis of nominally scaled variables which—going beyond the analysis of two-dimensional relations through measures of association—are capable of analyzing multivariate relations (e. g. on the basis of loglinear models)⁴⁰. In connection with nominal variables, also termed qualitative variables, a misleading differentiation between "qualitative" and "quantitative" methods has arisen in historical discussion. Often, quantification is considered only in the narrow sense of the term, as the application of quantitative methods to metric variables. This narrow view corresponds to the typical use of quantification in German economic and social history, where source material already in quantitative form is examined and evaluated. In contrast quantification in historical social research is appropriate not only for metric variables but for non-metric variables as well. The criterion for differentiating between qualitative and quantitative methods is, therefore, not the measurement level of the variables under scrutiny, but rather the level of theoretical orientation and formalization in the research operations used.

Mathematical procedures are only meaningful when an elementary and fundamental requirement of research strategy is satisfied: The relations between the objects must be reflected by the relations between the numerical values. This precept on the validity of quantification has such prerequisites as the validity of term development (the precise assignment of designates), indicator development (representative description of the cases characterized by a term) and of variable development (systematic assignment rules). Another important precept concerns the reliability of quantification which depends on three requirements that must be satisfied: intertemporal stability (repeated measurement of the same phenomena bring the same results), intersubjective stability (different researchers using the same measuring devices on the same phenomena attain

40) For an introduction see Gerhard Armingier's chapter on "Zusammenhänge zwischen nichtmetrischen Variablen," in: Konrad H. Jarausch et. al., *Quantitative Methoden in der Geschichtswissenschaft. Eine Einführung in die Forschung, Datenverarbeitung und Statistik* (Darmstadt, 1985), pp. 162 - 181 (with more far-reaching literature).

the same results) and inter-instrumental stability (the use of differing measuring devices on the same phenomena lead to the same results).

The fifth step in a general research strategy consists of the analysis of the data. Statistics provide the methods for the aggregation, processing, and interpretation of numerical evidence. Statistics are an aid in consolidating, structuring, or grouping numerical data, and may also be put to illustrative purposes. Further, statistics put procedures at the researcher's disposal which enable him to prove and evaluate hypotheses. In contrast to the field of qualitative procedures where the explanatory capacity of hypotheses remains vague, the application of statistical analysis delivers criteria which make it possible to prove the correctness and the range of the explanations proposed. In statistics, one may differentiate between causal analysis (e. g. path-analysis) and those methods which reduce the exsistant complexity of information to a few dimensions, as in the case of multidimensional scaling or factor analysis 41). The application of statistical models also invalues the precept of validity; criteria for the adequacy of a statistical model for the question to be examined may not be drawn from statistics alone, but must be developed through the constitution of hypotheses and through operationalization. The choice of a particular statistical model is always made under the assumption that its conditions completely reproduce those of reality or--in the case of incomplete representation--that observable deviations from reality may still be tolerated without endangering the validity of the application.

Quantification is not data-processing. One should not confuse a general methodology with an important research tool. The difference between "traditional" and more advanced applications of statistics is undoubtedly the latter's routine use of electronic data-processing for the examination and analysis of data--a use which has greatly broadened the scope and the epistemological potential of quantification 42).

The five stages of a general research strategy outlined here must be transformed into directly applicable methods of investigation suited to the specific case under study. In spite of the fact that empirical social research has already developed an arsenal of adequate and tested methods and has systematized them for use in research and education, no text book, on *Methods of Historical Social*

41) For practical applications, see Hans H. Bloetvogel, "Faktorenanalytische Untersuchungen der deutschen Großstädte nach der Berufszählung 1907," in: Wilhelm H. Schröder, ed., *Moderne Stadtgeschichte* (Stuttgart, 1979), pp. 74 - 111; Heinrich J. Schwiipe, "Faktorenanalyse und Clusteranalyse. Möglichkeiten des Einsatzes multivariater Verfahren in der Analyse des Verhältnisses von Stadt und Land im östlichen Münsterland im frühen 19. Jahrhundert," in: *ibid.*, pp. 112 - 144.

42) For data-processing see especially, Manfred Thaller, "Numerische Datenverarbeitung für Historiker," (Wien, 1982); Konrad H. Jarausch et al., *Quantitative Methoden*, pp. 58 - 73 (Author: Manfred Thaller); see also Manfred Thaller's column, "Historical Software Section," in: *Historical Social Research/Historische Sozialforschung*.

Research, as such has yet been written⁴³). Although the development of genuinely valid methods or systematic procedures for historical social research has begun in many areas, only the first steps have been taken. When historical social research's attempts at methodological development could adapt methods already existent in neighboring disciplines, progress has been relatively rapid. Such a methodological development within historical social research may be observed, e. g. in certain topics (stratification and mobility research, historical demography...) for specific historical source groups (files, texts, parish registers, census manuscripts...), for particular types of data collecting (content analysis, retrospective interviews...) and for special analysis procedures (time series analysis, analysis of aggregated data, application of loglinear models...) 44).

Perspectives in historical social research in the Federal Republic of Germany

When asking how successful historical social research has been in its attempt to broaden the scope of historical studies and to introduce a methodologically stricter concept of experience, it must not be forgotten that historical social research has been in existence in the Federal Republic of Germany for only about ten years as an approach encompassing a large number of researchers and the usual range of dissemination media⁴⁵). This is a short time when set against the general time-span of large projects and the sluggish spread of scientific results. Nonetheless, the standardized examination of historical mass sources and the utilization of computers has become routine and has lost the exotic flavor it may once have had. Especially historical demography, history of the family, collective biography, and the history of voting behavior have reached a high standard and have made significant contributions to contemporary discus-

43) In the meantime, German textbooks on quantitative history have also been published; see Konrad H. J a r a u s c h et al., *Quantitative Methoden*; Dieter R u l o f f, *Historische Sozialforschung. Einführung und Überblick* (Stuttgart, 1985); Roderick F l o u d, *Einführung in quantitative Methoden für Historiker* (Stuttgart, 1980), a sometimes inadequate translation of the 2nd ed. of *An Introduction to Quantitative Methods for Historians* (London, 1979); Norbert O h l e r, *Quantitative Methoden für Historiker. Eine Einführung* (Munich, 1980).

44) A good survey of research in this area can be found in the periodical documentary volumes in the series, *Historisch-Sozialwissenschaftliche Forschungen*, each of which contains extensive reports on research projects in the field of historical social research; cf. also R u l o f f, *Historische Sozialforschung*, pp. 70 - 194.

45) This beginning can be almost exactly dated to the year 1975 when the association, QUANTUM, was founded. QUANTUM launched the journal, *Historical Social Research/ Historische Sozialforschung* (initially as a newsletter with the title, QUANTUM-Information), as well as the publication series, *Historisch-Sozialwissenschaftliche Forschungen*. At the same time it created an academic audience for quantitative historical social research in the Federal Republic through a series of conferences and working conventions.

sions in sociology and history 46). German quantitative history today cannot be labelled, "backward", anymore.

Still, many contemporary observers show a scepticism and reservation regarding the gains of historical social research that cannot simply be explained by insinuating that an exotic novelty naturally loses its fascination 47). On the contrary, many have only now come to realize that the use of quantification implies specific limitations. At first sight, the need for methodological self-discipline and asceticism in the face of speculative temptation might seem to be the greatest restriction. Even more conflicting, however, is the fact that micro-analyses in which people are the study units are almost exclusively limited to research on institutionally defined roles and formal structures. Quantifiable mass sources are typically the products of public book-keeping which in its function and fact-gathering method is incapable of covering the informal world. Not only official secrets and matters left to personal discretion are badly recorded, but also, more generally speaking, the intent and motivation of human activity are left out. With the help of quantitative methods, we are quite capable of reconstructing the formal "structure of opportunity 48)" of past societies, as well as the way people behaved within this framework. But only rarely can a quantitative answer be given to the question of how people viewed the conditions under which they acted. One might expect that the use of systematic content analysis (a method too often neglected) might shed some light onto this darkness, but success remains limited: It cannot be forgotten that until the late 19th century the great mass of society was illiterate; the scope of the evidence for systematic content analysis, however, is limited to the literate elites.

Comparative restrictions must also be accepted in research on a higher level of aggregation, i. e. when regional units or organisations are the units of observation. Typical data sources here are administrative statistics. But the goals of administrative data-collecting do not necessarily coincide with the interests of present researchers. It seems obvious that the study of questions not covered by immediate statistical evidence must be given up, but it is also understandable that the claim is very reluctantly waived. One way out of this dilemma is to choose methods of indirect measurement and highly complex analysis procedures that attempt to examine the "unmeasured" through the use of mathematical operations on manifestly empirical evidence. The application of such procedures is dependent on long chains of inference needing many pre-requisites. Here historical social researchers have sometimes skated on thin ice. The use of

46) This is also documented by the (meanwhile) 21 volumes of *Historisch-Sozialwissenschaftlichen Forschungen*.

47) Cf. et al. the section, "Qualitative Kritik", in: Konrad H. J a r a u s c h et al., op. cit., p. 195 ff.

48) Cf. Talcott P a r s o n s / Edward A. S h i l s, ed., *Towards a General Theory of Action* (New York), p. 225 f.

the "cattle-quota" as an indicator for the secundarization of national economies in the late 19th century 49), or population growth as a substitute for missing data on the gross national product 50) are examples of this tendency. The question is whether or not historical social research can meet its own demand of utilizing more valid evidence than "traditional" history while skirting the borderline of the measurable. At this point a descriptive casuistry would be more appropriate. This raises a more fundamental consideration: historical social research should complement philological historiography, but it is no substitute for it. If we allow the world beyond the data to turn into forbidden ground, our view of history will degenerate into a collection of disparate phenomena and events. However, this is not a *carte blanche* – quantitative methods do have greater evidential power than the hermeneutic circle. The maxim that, *ceteris paribus*, those procedures should be used that offer the most reliable results, makes quantification with a good data base preferable.

As far as the future potential of quantitative historical research is concerned, one may voice the optimistic prognosis that the scope of historical social research will be broadened in the next few years. Historical social research is profiting from technical innovations, e. g. the microcomputer which allows on the spot data-collecting in archives, and the development of more efficient word processing which greatly reduces the time and financial costs of transforming texts into machine-readable form. Efficient data-bank systems decrease the loss of information occurring through transformation of sources into data 51). Therefore, the demand for theory-guided research is rapidly loosing its technological foundation. New techniques of random sampling for complexly structured and/or damaged populations can now often reduce the survey effort without loss of information. Today historical source materials can be used which previously would have been considered too extensive, too complex in their content, or too oblique in their structure 52). Progress and new possibilities may also be seen in the area of analysis procedures. For example, the methodological repertoire of network analysis can be successfully applied to the profusely documented

49) Cf. et al. Richard H. Tilly, *Sozialer Protest*, p. 185.

50) Paul B. H u b e r, "Regionale Expansion und Entleerung im Deutschland des 19. Jahrhunderts: Eine Folge der Eisenbahnentwicklung?" in: Rainer F r e m d l i n g/Richard H. T i l l y, ed., *Industrialisierung und Raum. Studien zur regionalen Differenzierung im Deutschland des 19. Jahrhundert* (Stuttgart, 1979), p. 37 ff.

51) Cf. Manfred T h a l l e r's column, "Historical Software-Section" (see ft. 42) in the journal, *Historical Social Research/Historische Sozialforschung* and also, M. T h a l l e r, "Automation on Parnassus. CLIO-A Databank oriented System for Historians," in: *Historical Social Research/Historische Sozialforschung* 15 (1980), pp. 40 - 65.

52) Cf. et al. Harald R o h l i n g e r, "Quellen als Auswahl-Auswahl aus Quellen," in: *Historical Social Research/Historische Sozialforschung* 24 (1982), pp. 34 - 62.

historical data on interlocking positions and kinship patterns⁵³). New procedures in the multivariate analysis of event data represent efficient statistical instruments, especially suited to a science like history which considers events and development over long periods of time⁵⁴).

Problems in the adaption and transfer of the methods and research instruments do lead to bottlenecks. The most important future task of interdisciplinary historical social research is, however, precisely the solution of these problems.

53) Cf. et al. The KZfSS.s special issue (1984) on the analysis of social networks.

54) Cf. et al., Hans-Jürgen A n d r e ß, *Multivariate Analysen von Verlaufsdaten. Statistische Grundlagen und Anwendungsbeispiele für die dynamische Analyse nichtmetrischer Merkmale* (Mannheim, 1985); for an example of practical application: Heinrich B e s t, "Reconstructing Political Biographies of the Past: Configurations, Sequences, Timing, and the Impact of Historical Change," in: Helene M i l l e t et. al., ed., *Prosopographie et Informatique* (Paris, 1985).